The duration-specific peak running demands of Academy level rugby league match-play.

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Introduction: Quantifying the peak distances that players cover across specific durations of time is important to enhance training prescription and appropriately prepare players for rugby league match play. This study aimed to quantify, and compare, the peak running demands of different positional groups during professional academy rugby league match play.

Methods: Following institutional ethics approval, 10-Hz Global Positioning System (GPS) (Optimeye S5, Catapult Innovations) data were collected from one hundred and forty-nine players competing across nine teams during 21 professional Academy (under-19) matches. Players were split into six positional groups for analysis: hookers (Ho; *n*=40), fullbacks (Fb; *n*=24), halves (Ha; *n*=47), outside backs (OB; *n*=104), middles (Mid; *n*=118) and back rows (BR; *n* = 104). Players who played less than 10 minutes were excluded from analyses. Data were extracted using propriety software Openfield. 10-Hz velocity files were exported with the duration-specific peak running demands determined via moving averages of relative distance ($m \cdot min^{-1}$) for 10- and 30-seconds, and 1- to 5- and 10-minute durations. Data were log-transformed and differences between positional groups were analysed using linear mixed effect models to account for repeated observations on players and teams, followed by magnitude based inferences, with the threshold of the smallest worthwhile difference set at 0.2 x between-subject standard deviation.

Results: The highest peak running demands for 10-seconds, 1- and 10- minutes were 368 ± 39, 178 ± 16, and 106 ± 9 $m \cdot min^{-1}$. Fb *most likely* had greater peak running demands compared to Mid, Ho and BR over 10- and 30-second, and 1- and 5-minute durations (% difference: 6.3 – 18.9, effect size [ES]: 2.1 – 6.0), and compared to OB over all durations except 10-seconds and 2-minutes (% difference: 6.1 – 11.4, ES: 2.9 – 6.4). Ho had *most likely* and *very likely* decreased peak running demands compared to OB at 10- and 30-seconds respectively (% difference: 5.1– 13.0, ES: 2.6 – 5.4), but *most likely* increased demands at 4-, 5- and 10-minute durations (% difference: 4.2 – 6.1, ES: 2.5 – 3.8). Similarly, compared to OB, the Mid and BR had *most likely* decreased relative distance at 10-seconds (% difference: 9.4 – 14.6, ES: 4.5 – 8.5), but *very likely* increased at 10-minutes (% difference: 2.9 – 3.4, ES: 2.5).

Conclusion: This study provides 'league-wide' peak running demands of Academy level rugby league match-play across varying durations that can be used by practitioners to prescribe conditioning drills and monitor the intensity of coach-led drills. Differences in the peak running demands are present between positional groups; Fb exhibit the greatest running intensities across all durations and OB have greater short duration demands, but lower longer durations compared to Ho, Mid and BR. Therefore position-specific prescription should be considered when prescribing velocity-based training intensities across short and longer durations.